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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/061,836	01/31/2002	Michael D. Miller	10012063-1	9497

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

AHMED, SHAMIM

ART UNIT PAPER NUMBER

1765

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/061,836

Applicant(s)

MILLER ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 9,20 and 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-8,10-15,17-19 and 21-26 is/are rejected.
- 7) ☒ Claim(s) 4 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-8,10-19 and 21-26, drawn to a process, classified in class 216, subclass 17.
 - II. Claims 9, 20, drawn to a product, classified in class 347, subclass 20.
 - III. Claim 27, drawn to an apparatus, classified in class 156, subclass 345.1.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by different process such as punching.

3. Inventions I and III are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process can be practiced by different apparatus such as a punching machine without the aid of a computer.

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4. Inventions II and III are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case the product can be made by another different apparatus such as a punching machine without the aid of a computer.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Paul Mitchell on 8/28/03 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-8,10-19, 21-26. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9,20 and 27 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 6-7, 10-15, 17-19 and 21-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujikawa (JP-11-198387).

As to claim 1, since the process steps are not in sequence, Fujikawa disclose a process of forming a slot in a print head substrate, wherein forming a trench (10) in a first surface of the substrate (1) opposite to a side subjected to an isotropic etching by sand blasting or dry etching or the like and a step of forming a second trench or opening by subjecting the substrate (lower surface) to anisotropic etching while penetrating the trench (10) in order to form the slot (see the abstract and figures 2a-2b and paragraph 0014 of the translated version).

Fujikawa also teach that the anisotropic etching could comprise a chemical dry etching (see paragraph 0041 of the translated version).

As to claim 3, Fujikawa teaches the dry etching (anisotropic) etching removes about 75 percent of the substrate (see figures 2a-2b).

As to claims 6-7, Fujikawa teaches that the dry etching forms a portion of the slot with orthogonal planar surface (see figure 2b).

As to claim 10, Fujikawa teaches the width of the slot is 140 micrometers and the thickness of the substrate is 625 micrometer (see paragraph 0037-0038), which teaches

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the limitation of the slot having an aspect ratio of greater than or equal to about 3 because aspect ratio is the thickness of the substrate divided by the width of the slot.

As to claim 11, Fujikawa teaches that the step of removing is an anisotropic etching, which comprises chemical dry etching (see paragraph 0041).

As to claim 13, Fujikawa teaches that the dry etching is actually performed several times and the amount of over etching is calculated, which is not larger than the previous etching (see paragraph 0037 of the translated version).

As to claims 14-15, Fujikawa teaches that the width of the second trench is less than 240 micrometers (microns), wherein the second trench is considered to be the trench 10, which is less than 50 percent of the substrate thickness, since the process steps are not in sequence in the instant application (see figures 2a-2b).

As to claim 17, since the process steps are not in sequence, Fujikawa teaches forming a second trench having a length that the breakthrough occurs at about 25-about 75 percent length of the first trench, wherein the second trench is considered to be the trench 10 (see figures 2a-2b).

As to claim 18, since the process steps are not in sequence, Fujikawa teaches that the first trench (anisotropic) has a depth of about 25-about 75 percent of the substrate thickness (see figure 2b).

As to claim 19, Fujikawa teaches the maximum width of the second trench (10) is 140 micrometers, which is less than 300 percent of the first trench formed by anisotropic etching (paragraph 0036 of the translated version and figure 2b).

As to claim 21, Fujikawa teaches that the maximum width of the slot is less than or equal to about 50% of the thickness of the substrate (see figures 2a-2b).

As to claims 22-23, Fujikawa teaches that a trench is created by a process of sand drilling (sand blasting) or dry etching or the like (see the abstract).

As to claims 2 and 24, Fujikawa teaches that the dry etching is performed through a thin film side of the substrate (see paragraph 0036 of the translated version).

As to claim 25, Fujikawa inherently teaches the property of the slot that reduces bubble accumulation because the Fujikawa's slot is made by exactly similar process as the instant invention.

As to claims 12 and 26, Fujikawa teaches that the trench 10 can be formed by dry etching before the anisotropic act of removing (claim 12) or act of creating in order to form the opening or slot through the entire substrate (claim 26) (see the abstract)

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikawa (JP-11-198387).

As to claim 8, Fujikawa discussed above in the paragraph 9 but fails to teach that dry etching is performed before the act of sand drilling or sand blasting.

However, it would have been obvious to one skilled in the art at the time of claimed invention to rearrange the process sequence, since it has been held that the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguish the processes. *Ex parte Rubin* 128 USPQ 440 (PTO BdPatApp 1959).

As to claim 5, Fujikawa teaches that sand blasting can be used to form a portion of a slot in the paragraph 9 above but remain silent about forming curved surfaces.

It would have been obvious to have roughened or curved surfaces because the course of the sand during the blasting or drilling process.

Allowable Subject Matter

13. Claims 4 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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14. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not teach or suggest the dry etching removes 50 percent of the thickness of the substrate or in other words, the prior art does not teach a process of forming a second trench, wherein the breakthrough occurs at equal to the length of the first trench, which is formed by dry etching.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (703) 305-1929. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Shamim Ahmed
Examiner
Art Unit 1765

SA
September 3, 2003